

**OBJECTIVES:** To determine recurrent (infective) exacerbations (AECOPD) and health care utilization among patients with moderate to very severe COPD. **METHODS:** Data for this study was obtained from the PHARMO Record Linkage System (RLS), which includes drug dispensing records from pharmacies, hospitalization records and detailed information from general practitioners. Patients with moderate to very severe COPD (GOLD II–III–IV) and a moderate or severe AECOPD between 2000 and 2010 were included in the study. Moderate and severe AECOPD were defined by drug use and hospitalizations respectively. Date of first AECOPD after first GOLD classification-test was defined as cohort entry. Study patients were followed from cohort entry to end of registration in PHARMO RLS, death, or end of study period, whichever occurred first. During follow-up, all recurrent AECOPDs were counted and characterized by type of AECOPD and health care utilization. **RESULTS:** Of 886 patients included in the study, 56% was male and mean ( $\pm$ SD) age was 66 ( $\pm$ 11) years. The proportion of patients with GOLD II, III and IV was 52%, 34% and 14% respectively. At cohort entry, 747 patients (84%) had a moderate AECOPD and 139 (16%) had a severe AECOPD. The overall exacerbation recurrence rate per person year (PY) was 0.9. When stratifying by GOLD stage at cohort entry, this rate increased from 0.6 for patients with GOLD II to 1.1 for GOLD III patients and 1.3 for GOLD IV patients. The rate of severe exacerbations was 0.1 for patients with GOLD II and III and 0.2 for patients with GOLD IV. Mean hospital stay for severe exacerbations was 12 ( $\pm$ 11) days and 75% were infectious. Moderate exacerbations were mostly treated with tetracyclines (46%), followed by penicillins (34%). **CONCLUSIONS:** This study provides a comprehensive overview of recurrent AECOPD among patients with moderate to very severe COPD, but also emphasizes the need for more research in infective AECOPD.

#### PRS9

##### ALLERGIES: DISTRIBUTION AND PERCEPTION IN THE GERMAN GENERAL POPULATION

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**OBJECTIVES:** To obtain population based data on the prevalence of allergies and to provide insight into allergy care and perceptions. **METHODS:** A random representative sample of the German population (>18 years) was recruited for a telephone survey in 2012. Descriptive data were stratified by criteria relevant for health-service research as age, sex, geographical region insurance status. **RESULTS:** For 51% of the n=1,004 respondents the topic “allergy” was personally relevant. One third of all respondents (33%) rated a physician-diagnosed allergy. Prevalence was higher in women (39%) than in men (27%) and in persons with higher educational level (39% vs. 33% lowest level). The most common allergen (43%) was pollen; 15% reported to have contact dermatitis (women 21%, men 5%). The majority of allergic persons (53%) felt (highly) burdened and 48% were limited in their daily activities due to symptoms. 70% have ever seen a physician or other therapist for their allergy (East: 62%, West 72%); GPs (45%) and dermatologists (41%) were consulted mainly. Self-medication was frequent among allergic persons (58%); it was most prevalent in the highest income and education groups as well as in West Germany. Medical treatment of acute symptoms was reported by 21% of the respondents. Regarding allergy perception, 39% appraised allergies as “easily treatable”; this opinion was more prevalent in women and in privately insured persons. In an open question on potential allergy triggers environmental factors were mentioned most often (26%), chemical agents. **CONCLUSIONS:** About one-third of the German general adult population is affected by allergies and constricted by acute symptoms. There is evidence for need of improvement concerning awareness and appraisal of allergies - which are not distributed evenly over social groups. In particular, there is a gap of using adequate medical treatment of acute symptoms.

#### PRS10

##### AN ANALYSIS OF REPORTED PNEUMONIA DEATHS IN MALAYSIA

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**OBJECTIVES:** It is estimated that there are 25 million cases of pneumonia worldwide with 63,500 deaths from the disease annually. *Streptococcus pneumoniae* (S.pneumonia) is one of the main pathogens that cause pneumonia. Apart from S.pneumonia, some other common pathogens include *Haemophilus influenzae*, *Staphylococcus aureus* and *Klebsiella pneumoniae*. However, pneumonia data from South East Asia is lacking. According to the Department of Statistics Malaysia, pneumonia is one of the top five causes of death in Malaysia. This study sought to describe pneumonia mortality in Malaysia using death statistics from the Department of Statistics Malaysia. **METHODS:** This study used death data from 2004 to 2008 obtained from Department of Statistics Malaysia. For the purpose of analysis, medically certified deaths that were due to pneumonia were analysed by age group. Pneumonia death rate was calculated against the population age cohorts for each year. Rates were reported in deaths per 100,000 population. **RESULTS:** The average crude mortality rate in Malaysia for the period 2004 to 2008 ranged from 440.4 to 454.0 per 100,000 population. However, deaths attributed to pneumonia showed an increasing trend from 11.9 (2004), 12.9 (2005), 13.8 (2006), 15.6 (2007) and 19.3 (2008) per 100,000 population. **CONCLUSIONS:** Deaths due to pneumonia over the period 2004 to 2008 have shown an increase even though the crude death rate has been stable during that time. Further analysis to determine pathogens and aetiology of the pneumonia deaths is warranted.

#### RESPIRATORY-RELATED DISORDERS - Cost Studies

#### PRS11

##### THE SHORT-TERM ECONOMIC IMPACT OF THREE CHILDHOOD PREVENTIVE HEALTH PROGRAMS IN ISRAEL

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**OBJECTIVES:** To estimate the budget impacts of immunization against pneumococcal disease (PD) and human papillomavirus (HPV), and of prophylaxis against severe respiratory syncytial virus (RSV) disease, in Israel. **METHODS:** Incidence-based models compared the annual budget impact, from the Israeli health care system perspective, of the PD and RSV programs. Because HPV disease is slow developing, cumulative five-year disease costs were instead modelled for this program. Model inputs were from published literature. Outputs included total program cost, disease costs and disease cost offsets, in 2012 Israeli New Shekels (NIS). **RESULTS:** A 13-valent pneumococcal conjugate vaccine (PCV13) vaccination program, covering 175,428 infants, prevented approximately 78 cases of invasive disease, 218 of pneumococcal pneumonia and 225 of pneumococcal otitis media. Immunization against HPV in a year's cohort of 66,185 twelve-year old girls prevented approximately 321 cases of cervical intraepithelial neoplasia and 48 cases of genital warts over five years. RSV prophylaxis in 2,266 high-risk infants prevented approximately 138 hospitalizations for severe RSV disease. Total disease costs in year one of the model, without the programs, were 7,250,461 NIS (PD) and 17,988,932 (RSV infection); cumulative five-year disease costs in the HPV model without immunization were 1,331,194 NIS. Total disease costs, with the programs (excluding the cost of prophylaxis) were 3,305,522 NIS (PD) and 14,426,876 NIS (RSV disease), for annual savings of 3,944,939 NIS and 3,562,056 NIS, respectively. HPV disease costs over five years with the program were 535,480 NIS, saving an estimated 795,713 NIS over five years. The immunization programs cost: 133,135,790 NIS (PD), 35,106,399 NIS (HPV) and 34,888,624 NIS (RSV disease). **CONCLUSIONS:** All programs had substantial acquisition costs, but annual net savings, when the costs of the program were excluded. Even programs considered expensive are well-positioned financially within the context of other childhood preventive health strategies, when targeted to appropriate populations.

#### PRS13

##### VARIATION OF COST OF CHRONIC OBSTRUCTIVE LUNG DISEASE IN ADULTS IN GERMANY: A SYSTEMATIC REVIEW

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**OBJECTIVES:** A significant economic burden for society is linked to chronic obstructive lung diseases because of their high and still growing epidemiologic impact worldwide. The purpose of this systematic review is to estimate the cost-of-illness per case for the two most important obstructive lung diseases, asthma and COPD, for adults in Germany. **METHODS:** A systematic search of Pubmed, Embase, EconLit and Business Source Complete was performed for the years 1995 to 2012 in order to identify German cost-of-illness studies for asthma and COPD. Studies identified were analysed according to methods used, and cost findings were inflated to 2010 prices and compared within the same disease. **RESULTS:** Six studies for asthma, seven for COPD and one for both diseases met the inclusion criteria. The costs for asthma differ widely, ranging from minimum to maximum by a factor of 6.7 for direct costs and 9.6 for indirect costs per case. For COPD, costs per case ranged by a factor of 4.2 for direct costs and of 6.5 for indirect costs. In spite of the heterogeneity in methodology and results, medication could be identified as the most important single component of direct costs, and work loss as the most important component of indirect costs. All in all, the estimated costs per case of illness and year varied by a factor of 5.7 with a maximum slightly above 2,500 € for asthma and by a factor of 2.9 with a maximum of almost 3,500 € for COPD. **CONCLUSIONS:** Findings confirm that asthma and COPD are costly but results vary markedly. COPD causes both higher costs per case and higher total costs as a result of its higher prevalence. Results emphasize the economic relevance of effective prevention and disease management for these chronic obstructive lung diseases.

#### PRS14

##### CLINICAL AND PHARMACOECONOMIC ASPECTS OF ALLERGEN IMMUNOTHERAPY IN THE SLOVAK REPUBLIC

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**OBJECTIVES:** To evaluate direct costs of allergen immunotherapy with regard to its clinical benefit in the treatment of allergic rhinitis in the Slovak Republic. **METHODS:** In co-operation with the General Health Insurance Company, the largest insurer in Slovakia covering approximately 66% of all patients, the clinical benefits were analyzed with respect to direct medical costs (cost of illness), costs minimization and prevention of onset of asthma bronchiale (AB), in a short- and a long-term period. The outcomes were obtained from an analysis of a group of 109,974 patients who were newly diagnosed with allergic rhinitis (AR) in 2002 and were followed up until the end of 2010. In 2010, allergic rhinitis was detected in only 14,742 of these patients. **RESULTS:** The prevalence of AR and AB was 9.34% and 4.74%, respectively. In 2010, the total direct costs of AR and AB in Slovakia were approx. 37,946,000 € and 51,512,000 €, respectively. Direct medical costs of AR and AB treatment in 2010 in the evaluated group were 50.14 € and 198.03 €, respectively. Allergen immunotherapy decreases average annual costs of pharmacotherapy of AR by 17 € per patient and annual costs of prevention of onset of AB by 164.89 € per